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GAME MACHINE WITH AN ON-THE-SPOT-BROADCASTING FUNCTION
[Jikkyo chukei kinou tsuki gemuki]

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(54) [Title of the Invention] /1*

GAME MACHINE WITH AN ON-THE-SPOT-BROADCASTING FUNCTION

(57) [Claims]

[Claim 1]

The game machine with an on-the-spot-broadcasting function, which is equipped with several operation members to operate the characters displayed on the monitor and a control unit to advance the game following the game program by operating said operation members is characterized by having a memory means, which stores a specific amount of data of on-the-spot-broadcasting terms corresponding to the proceedings of the game and the operation details of the operation members, in relation to the number of transfers; a term specification means, which specifies the on-the-spot-broadcasting terms corresponding to the proceedings of the game and the operation details of the operation members; a voice output means, which converts the stored data into an audible speed voice while temporarily storing the terms; and a transfer means, which divides specified terms into said number of transfer times and transmits from said memory means to the voice output means.

Store data [illegible] Correspon To [illegible]

[Claim 2]

The game machine with an on-the-spot-broadcasting function in Claim 1 is characterized by the fact that said divided

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[*] Numbers in the margin indicate pagination in the foreign text.

transfer is an interruption action.

[Claim 3]

The game machine with an on-the-spot-broadcasting function in Claim 2 is characterized by equipping a timer to execute interruptions for transfer at regular intervals.

[Detailed Explanation of the Invention]

[0001] [Industrial Field of Application]

The invention pertains to the game machine, which is equipped with several operation members to operate the characters displayed on the monitor and a control unit to advance the game following the game program by operating said operation members. Specifically, it pertains to the game machine that utilizes the on-the-spot-broadcasting function corresponding to the proceedings of the game.

[0002] [Prior Art] /2

The former TV game machine is known to have sound effects (sound of steps) of the characters displayed on the monitor. The baseball and golf game set with on-the-spot sound effects has been proposed in Kokai No. 55-56686 and 55-72994, in which setting a sound recording sheet on the game machine to output on-the-spot sound corresponding to the proceedings of the game in order to give a sense of virtual reality.

[0003] [Problems that the Invention is to Solve]

The sound of steps corresponding to the characters' movement is short, can be repeated, and responds only to a specific movement. However, outputting a long sound, such as a sentence, using the previous method can be a hindrance to the proceedings of the game because of the large amount of data. The previous method is not suitable for on-the-spot-broadcasting, which requires complicated decision making during the proceedings of the game. The former baseball and golf game set is advanced by playing the on-the-spot-broadcasting, which is recorded on the recording sheet; therefore, the on-the-spot broadcasting is not corresponding to the operation of the game.

[0004]

The present invention is aimed at solving said problems. It provides a game machine with an on-the-spot-broadcasting function, which enables on-the-spot-broadcasting according to the proceedings of the game by specifying the adequate terms from the glossary storing the terms corresponding to the proceedings of the game and the operation details of the operational members.

[0005] [Means of Solving the Problems]

In this invention, the game machine with an on-the-spot-broadcasting function, which is equipped with several operation members to operate the characters displayed on the monitor and a control unit to advance the game following the game program by operating said operation members is characterized by having a memory means, which stores a specific amount of data of on-the-spot-broadcasting terms corresponding to the proceedings of the game and the operation details of the operation members, in relation to the number of transfers; a term specification means, which specifies the on-the-spot-broadcasting terms corresponding to the proceedings of the game and the operation details of the operation members; a voice output means, which converts the stored data into an audible speed voice while temporarily storing the terms; and a transfer means, which divides specified terms into said number of transfer times and transmits from said memory means to the voice output means. (Claim 1)

Store
term
corresponding
to proceeding

output

[0006]

The divided transfer can be an interruption processing. In this case, the game machine can be equipped with a timer to execute interruptions for transferring data at certain periods of time (Claims 2 and 3).

[0007] [Operation of the Invention]

According to the invention in Claim 1, when the on-the-spot-broadcasting terms corresponding to the proceedings of the game and the operation details of the operation members are specified, the transfer means reads the specified terms and transfers the data to the voice output means. The transferred terms are converted into audible speed while temporarily being stored in the voice output means and then are transferred in order. This means, when the on-the-spot-broadcasting terms corresponding to the proceedings of the game and the operation details of the operational members are specified, the transfer means divides the specified terms and reads the data for the number of transfer times. The divided data are temporarily stored in the buffer and then are transferred to the voice output means in order. This time sharing transfer smoothly transfers the data and prevents the temporary interruption of the game during the data transfer.

[0008]

According to the invention in Claim 2, the transfer of the on-the-spot-broadcasting terms is interruption action.

[0009]

According to the invention in Claim 3, the on-the-spot-broadcasting terms are transferred at regular intervals using the timer.

[0010] [Working Examples]

Figure 1 is a block diagram illustrating the structure of the game machine with an on-the-spot-broadcasting function, which pertains to the present invention. [1] are operation members, which are composed of operation levers, switches, and buttons. The operation details are input into a main CPU [3] through an input/output port [2]. In the operation members [1], the operation levers mainly specify the characters moving directions and the switches and buttons specify the movement of the characters; for example, the key movement of the baseball game, such as pitching, passing a ball, swinging a bat, and so on. In this kind of game machine, the player can create his own team by choosing the team or the players using the operation members [1].

[0011]

The main CPU [3] is in charge of controlling the entire movement of the game, which is provided with a ROM [31] (see Figure 2) to store the game program and a RAM [32] (see Figure 2) to temporarily store the processed data. Said ROM is not necessary when the game program is stored in the different body of a game cassette, which is easily attached or removed from the game machine.

[0012]

The memory unit [4] stores the necessary on-the-spot-broadcasting terms corresponding to the proceedings of the game and the operation details of the operation members [1]. The detailed structure is explained in Figure 2. For example, in the baseball game, the prepared screens are roughly divided into four. They are offense, defense, change, and game set screens. Each screen has the on-the-spot-broadcasting terms corresponding to the proceedings of the game.

phrases
stored
wRT
Game
Proceedings

[0013] /3

Terms prepared for the offense screen are, for example; "breaking pitch", "fast ball", "change-up", "strike", "ball", "no runner", "runner on first base", "batter out", "first base out", "change", "(name of the team)", "batting order", "defense", "(player's name)", "(uniform number)", and so on. These terms are used as; "breaking pitch, strike", "batting first, center, Shinjyo, uniform no. 5", "strike, batter out, three outs", and so on.

[0014]

Terms prepared for the defense screen are, for example; "got a hit", "hit the ball", "caught the ball", "to first base", "back to home plate", "this is a big hit", "hit the fence", "home run", "a hit", "two base hit", "two runs", "the ball got passed", "nice play", "start the scoring", "foul", and so on. These terms are used as; "hit the ball, it's a big hit, started the scoring by hitting a home run", "caught it, nice play, back to home plate, and out", and so on.

[0015]

Terms prepared for the change screen are, for example; "(inning number)", "the first half", "the second half", "the inning is finished", "(name of the team)", "scoreless inning", "came from behind", and so on.

[0016]

Terms prepared for the game set screen are; "today", "(name of the team)", "won the game", and so on.

[0017]

Terms with the same meaning, such as "got a hit" and "hit the ball" can be used in the different situations. For example, "got a hit" can be used when the hit turns the momentum of the game or when there is a runner and "hit the ball" can be used for the rest of the situations. The effective on-the-spot-broadcasting atmosphere can be created by preparing several different terms with the same meanings and using them depending on the different situations.

[0018]

The main CPU [3] specifies the appropriate terms corresponding to the proceedings of the game and the operation details of the operation members [1], modulates the pulse (PCM) of the specified data, compresses data, and then transfers the data to a sound CPU [5]. The sound CPU [5] temporarily stores the sound data (on-the-spot-broadcasting terms) transferred from the main CPU [3], demodulates or expands the data, reads out the data at audible speed, converts the data into an analog voice waveform signal by a sound controller [6], and then outputs the signal data from the speakers [8] through the amplifier [7].

[0019]

The CRT controller [9] outputs necessary screen signals or characters into a frame memory [11] by accessing graphic memory [10] according to the control signal from the main CPU [3]. The output screen signals or characters are stored in the frame memory [11]. A video signal generation circuit [12] converts the screen signal stored in the frame memory [11] into a video signal and periodically transfers the video signal to the monitor [13] comprised of CRT or LCD at high speed, and provides a still picture on the monitor [13].

[0020]

Figure 2 shows the structure of the memory unit [4] and its surrounding circuit. The memory unit [4] is composed of an on-the-spot-broadcasting term memory [41] to store necessary on-the-spot-broadcasting terms for the game's advancement corresponding to the address, a comparison memory [42] to store the on-the-spot-broadcasting terms corresponding to the proceedings of the game and the operation details of the operational members [1], in relation to the number of transfers, and a buffer to store terms by turns, which are specified by said main CPU [3].

[0021]

The on-the-spot-broadcasting term memory [41] is a ROM with necessary capacity of memory in which such terms are stored as a digital voice waveform data corresponding to the address. For example; terms, such as "strike", are stored in the address 1 to 10; terms, such as "batter out", are stored in the address 11 to 39; and terms, such as "three outs", are stored in the address 100 to 119. The comparison memory [42] is a ROM with necessary capacity of memory in which stores a destination address and a number of interruptions, in relation to the condition of proceedings of the game and the operation details of operation members [1]. The number of interruptions in the comparison memory [42] means the number of data transfers. For example, the voice waveform data, such as "strike", are divided into 10 transfer times. In general, the number of addresses for each term in the memory map of on-the-spot-broadcasting term memory [41] does not have to be the same as the number of interruptions. In this working example, the amount of transferring data for each transfer is 80H (approximately 128 byte).

[0022]

Said condition means a result of the game's progress obtained by the proceedings of the game and the operation details of the operation members [1]. For example, when the pitch is a "strike", the main CPU [3] specifies the term "strike" (address: 1; number of interruptions: 10) in the on-the-spot-broadcasting memory [41]. In this case, when the ball is "strike" on the third pitch, the main CPU [3] specifies "batter out" (address: 11; number of interruptions: 29) and when there are three outs, it specifies "three outs" (address: 100; number of interruptions 20). The buffer [43] is a RAM and stores the information in the order of "strike", "batter out", and "three outs" in this example.

[0023]

The on-the-spot-broadcasting terms are specified each time when the condition is created. The terms are stored in the buffer [43] and transferred in turns by the main CPU [3]. The interruption timer [33], which can be reset, sets up the timings for interruptions. For example, the interruption can be set every one sixtieth of a second. The main CPU [3] executes a transfer one tenth of the one-sixtieth seconds and processes the game the rest of time. This method prevents interrupting the game program caused by transferring the terms at one time. The interruption counter [34] counts the number of interruptions.

[0024] /4

Figure 3 is a flow chart showing an example specifying the on-the-spot-broadcasting terms corresponding to the specified condition. Figure 3 is the batting screen of the baseball game. It starts with the pitcher throwing a ball and then the pitch is judged to determine if it is a strike (S1). When the pitch is a "ball", the flow goes to S3 for the broadcasting of "ball". On the other hand, when the pitch is a "strike", (1; 10) of the comparison memory [42] is specified and the corresponding terms are transferred from the memory [41] to the buffer [43] (S5). Next, the pitch is decided if it is the third pitch to the same batter (S7). When determined it is not the third pitch, but rather the first or second pitch, the flow goes to S9 for the broadcasting of the next pitch. When a strike is the third pitch, (11; 29) of the comparison memory [42] is specified and the corresponding terms are transferred from the memory [41] to the buffer [43] (S11). When the batter is out, the out count is decided if it is the third out (S13). When the out count is not three, the flow goes to S15 for the broadcasting of "one out" or "two outs". When the out count is three, (100; 20) of the comparison memory [42] is specified and the corresponding terms are transferred from the memory [41] to the buffer [43] (S11). The interruption timer [33] starts at the same time as the game flow starts and the interruption counter [34] is reset to 1.

[0025]

Figure 4 shows the routine of the interruption transfer process. The interruption routine starts when one sixtieth of a second is passed on the interruption timer [33]. The buffer [43] is checked to see if it contains data to be transferred (S21). When there are data, "n=1" is checked (S23). When it is "n=1", this means there are terms to be transferred. The number of interruptions "Nd" is set in the comparison memory [42] corresponding to the data of terms (S25) and the flow goes to

S27. When it is not "n=1", this means the terms currently being transferred and the flow skips to S27.

[0026]

In the step S27, the data corresponding to the "n" time interruption are transferred from the buffer [43] to the sound CPU [5]. When the data transfer is completed, the current interruption numbers "n", in another words, the count of the interruption counter [34], increments by 1 (S29). The incremented number "n" and the number of interruption "Nd" is compared (S31). When the current interruption number "n" is smaller, the interruption timer [33] resets (S33) and completes the flow. On the other hand, when the current interruption number "n" and "Nd" are the same, this means one term transfer is completed; therefore, the current interruption number "n" resets to 1 (S35), and completes the flow. When there are no data in the step S21, the flow completes as is.

[0027]

The broadcasting voice from the speaker [8] through the sound CPU [5] is the audible speed; therefore, it is slower than the speed of data transfer. This time lag is effective when continuously transferring several terms without stopping while the speaker [8] is outputting the previous terms.

[0028]

The interruption is executed every one sixtieth of a second in this working example; however, the interruption cycle does not have to be fixed. The interruption can be executed while the task of the game process is minimal in the main CPU [3] and the speed of cycle is faster than the voice speed from the speaker [8]. The data transfer is available during the interruption process and the other series of processes as well.

[0029] [Effects of the Invention]

In this invention, the data for on-the-spot-broadcasting terms are divided into a fixed amount of data and transferred corresponding to the proceedings of the game and the operation details of the operation members; therefore, the data are smoothly transferred. It is effective in preventing the temporary interruption of the game procedure during the data transfer.

[0030]

The invention in Claim 2 provides the interruption process, which can be achieved only by the subroutine for the interruption. The invention in Claim 3 achieves a safe and fixed data transfer.

[Brief Explanation of the Drawings]

[Figure 1] A block diagram illustrating the structure of the game machine with an on-the-spot-broadcasting function, which pertains to the invention.

[Figure 2] A diagram illustrating the structure of memory unit and its surrounding circuit.

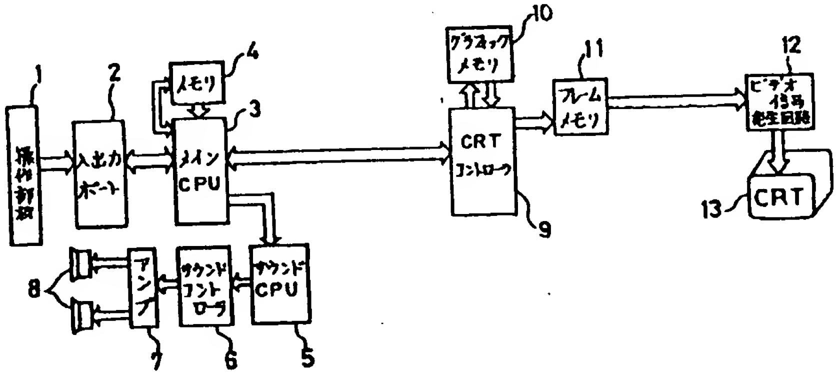
[Figure 3] A flow chart showing an example specifying the on-the-spot-broadcasting terms corresponding to the specified condition.

[Figure 4] A routine for the interruption transfer process.

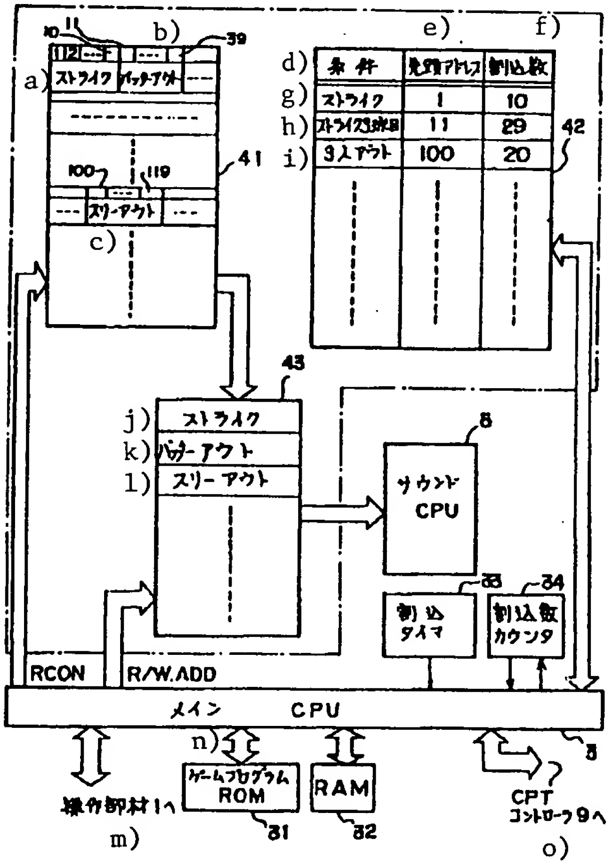
[Explanation of Reference Numerals] /5

1... operation members; 2... input/output port; 3... main CPU; 31... ROM; 32... RAM; 33... interruption timer; 34... interruption counter; 4... memory unit; 41... on-the-spot-broadcasting term memory; 42... comparison memory; 43... buffer; 5...sound CPU; 6... sound controller; 7... amplifier; 8... speaker; 9... CRT controller; 10... graphic memory; 11... frame memory; 12... video signal generation circuit; 13... monitor.

[Figure 1]

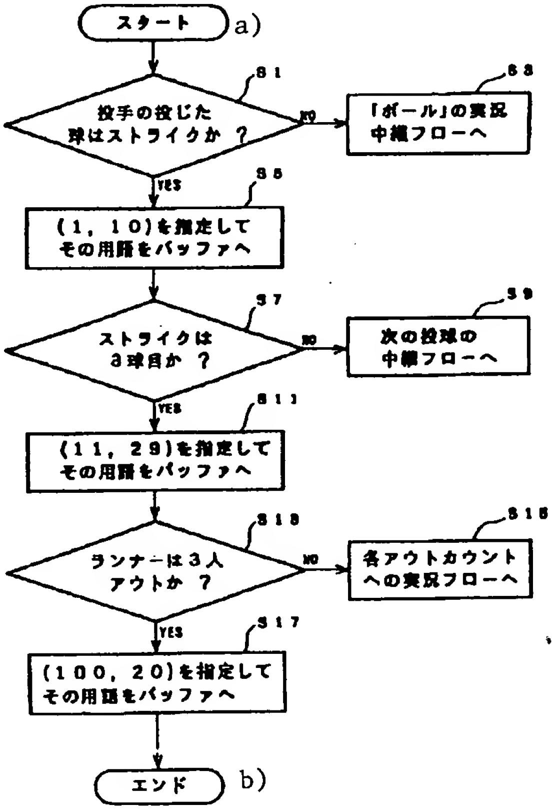

1
操作部材
2
入出力ポート
4
メモリ
3
メインCPU
10
グラフィックメモリ
11
フレームメモリ
12
ビデオ信号発生回路
CRTコントローラ
9
13
CRT
8
アンプ
サウンドコントローラ
サウンドCPU
7
6
5

[Figure 2]
Key: a) strike; b) batter out; c) three outs; d) condition; e) destination address; f) interruption number; g) strike; h) strike on third pitch; i) three outs; j) strike; k) batter out; l) three outs; m) to operation members [1]; n) game program ROM; o) to CPT controller [9].

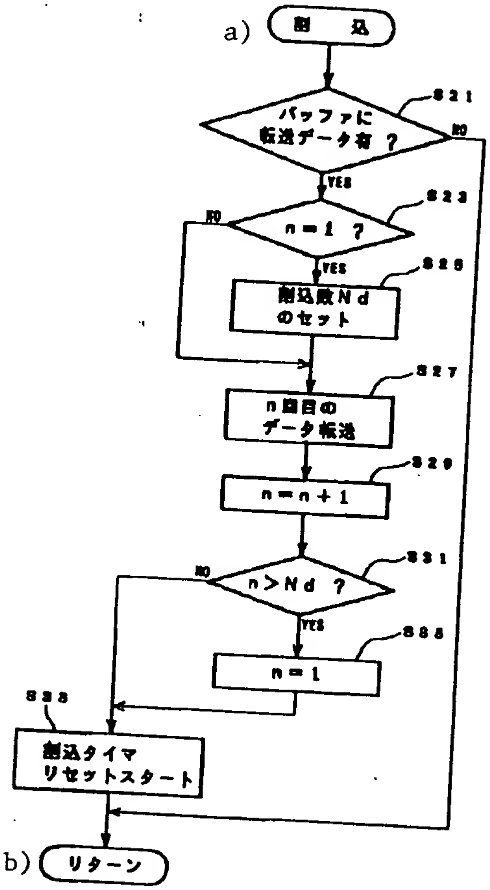

10
11
112
b)
39
a)
ストライク
バッターアウト
c)
100
119
スリーアウト
41
e)
f)
d)
条件
発動アドレス
割込数
g)
ストライク
1
10
h)
ストライク3球目
11
29
i)
3人アウト
100
20
42
43
j)
ストライク
k)
バッターアウト
l)
スリーアウト
8
サウンド CPU
33
割込タイマ
34
割込数カウンタ
RCON
R/W.ADD
メイン CPU
3
n)
ゲームプログラム ROM
31
RAM
32
操作部材1へ
m)
CPT
コントローラ9へ
o)

[Figure 3]

Key: a)start; S1) pitch is a strike?; S3) to broadcasting flow for "ball"; S5) specify (1, 10) and transfer terms to buffer; S7) third pitch is a strike?; S9) to broadcasting term flow for next pitch; S11) specify (11, 29) and transfer terms to buffer; S13) three runners are out?; S15) to broadcasting flow for each out count; S17) specify (100, 20) and transfer terms to buffer; b) end.


スタート
a)
S1
投手の投じた
球はストライクか ？
NO
S3
「ボール」の実況
中継フローへ
YES
S5
(1, 10)を指定して
その用語をバッファへ
S7
ストライクは
3球目か ？
NO
S9
次の投球の
中継フローへ
YES
S11
(11, 29)を指定して
その用語をバッファへ
S13
ランナーは3人
アウトか ？
NO
S15
各アウトカウント
への実況フローへ
YES
S17
(100, 20)を指定して
その用語をバッファへ
エンド
b)

[Figure 4]
Key: a) interruption; S21) transfer data in buffer?; S25) set interruption number "Nd"; S27) "n" times of data transfer; S33) reset and start interruption timer; b) return.


a)
割　込
S21
バッファに
転送データ有 ?
NO
YES
S23
NO
n＝1 ?
YES
S25
割込数Nd
のセット
S27
n回目の
データ転送
S29
n＝n＋1
S31
NO
n＞Nd ?
YES
S35
n＝1
S33
割込タイマ
リセットスタート
b)
リターン